

# **Program Certifies Systems Engineers**

## **Preparing Workforce for the Future**

Glenn's strong engineering workforce justgotstronger. Twenty-two employees graduated from the Space Mission Excellence Program (SMEP) on April 21 after undertaking a rigorous 18 months of engineering training focused on the discipline of systems engineering and integration. Additionally, four employees already SMEP certified, received Level II certification and three more achieved Level III certification.

Since the SMEP was initiated at the center in 2006, Glenn has certified 75 systems engineering practitioners who reside in the Systems Engineering and Analysis Division under Chief John Taylor. SMEP graduates are respected within the agency and professional organizations for the key roles they are undertaking in support of various



Those who attended the graduation include, back row, left to right: Wang, Goldin, Deputy Director Jim Free, Tofil, Klimek, Briggs, Forkosh, Wiedenmannott, Deloof, Mainger, Employee Development Lead Jennifer Budd, Director of Engineering Olga Gonzalez-Sanabria and Director of Center Operations Robyn Gordon. Front row, left to right: Freeh, Collins, Tin, Bleisath, Carek, Romanin, Saad, Kegege, Hewston, Knoblock and Golden.

projects within the center and on multicenter teams.

"This recent graduation represents an important milestone for Glenn due to first-generation participants achieving Level III distinction" explained Glenn's Workforce Development Manager for Systems Engineering Marton Forkosh.

The Human Capital Development Branch is working to extend SMEP training opportunities to areas outside of the Systems Engineering and Analysis Division. This will ensure that the majority of the engineering workforce will be able to include some level of systems engineering among its skill set.

Continued on page 4

# **SAMS, MAMS Celebrate Anniversaries Onboard Shuttle and Station**

## **First Microgravity Instruments Operated on ISS**

The Glenn-designed and built Space Acceleration Measurement System (SAMS), pictured, right, is celebrating 20 years of operation since its first space shuttle mission and 10 years of operations onboard the International Space Station (ISS). The Microgravity Acceleration Measurement System (MAMS) is also celebrating 10 years on the ISS. The SAMS and MAMS collect data characterizing the acceleration environment onboard spacecraft to help principal investigators evaluate how microgravity disturbances affect experiments.

Here are some highlights of the instruments:

- Glenn built eight SAMS flight instruments (units)
- First unit flew onboard STS-40; launched on June 5, 1991
- Unit on the ISS since April 19, 2001
- Seven units flew on 22 space shuttle missions in Spacelab & SPACEHAB modules, in the middeck and the cargo bay, through 2003



C-1999-563

5

Photo by Christopher Lynch

## In This Issue

- 2 ... Straight from the Director
- 3 .... FIRST Robotics Takes 10
- 4 .....Prairie Burning
  - ... Former Director Spotlight

Continued on page 3

# Straight from the Director

# The Right to Communicate

This month, I am writing about my feelings on everyone's right to communicate an issue or problem in the workplace.

First, I believe we, and that includes everyone, should make every possible attempt to resolve problems at the lowest level of the organization. By that I mean if you think someone has done something to harm you, has been disrespectful or has done something wrong, you should feel comfortable to discuss the issue and attempt to resolve the problem. To address your particular issue, I encourage you to

discuss it with your supervisor and/or director.

If you are uncomfortable with the results of that approach, you should always feel free to use more formal methods to address the issue, which includes working with the Union, the Office of Human Capital Management or the Office of Equal Opportunity Programs (EEO) to file any type of appropriate complaint or grievance.

I want to be very clear: I support the use of the grievance and EEO process



Center Director Lugo

and want to assure you that there will never be any form of retribution to an individual or a group if they use them. I understand that these processes are designed to assure that the issue is raised, investigated and resolved. I am happy to discuss my sentiment on this subject with anyone, but more importantly, I hope that this note clarifies where I stand.

On a separate subject, very soon I will share some interim results of our technology assessment. NASA Glenn has already made significant progress in cataloging more than 50 technologies. We also are nearing the start of our "Start, Stop, Continue" assessment which will be looking at our capabilities (People, Facilities, Tools). Stay tuned for more details on this developing activity.

# **Glenn Contributions to Aeronautics Research Rewarded**

## **2010 Associate Administrator Awards**

Glenn researchers and engineers had a banner year winning in 4 of 5 categories of the Aeronautics Research Mission Directorate's (ARMD) Associate Administrator Awards for 2010. The ARMD-AA awards are presented to NASA employees, contractors, students or interns whose work results in a profound impact and benefit to NASA's ARMD, its partners and/or stakeholders.

Glenn honorees accepted awards in the following categories:

## Leadership and Excellence

Individual Award *Gary Roberts*, Structures and Materials

Division

#### Group Award

The National Force Measurement Technology Capability Project, led by NASA's Langley Research Center. The Glenn team of Steve Helland, Aeronautics Research Office, and Mark Woike, Communications, Instrumentation and Controls Division, shared honors as members of this multi-center, government and industry team.

# Program & Mission Support Individual Award

Jose Rossoll, Testing Division

#### Strategic Partnerships

Group Award
The Shape Memory Alloy (SMA) Team,

Pictured left to right:
NASA's ARMD Associate
Administrator Dr.
Jaiwon Shin, ARMD
Deputy Tom Irvine,
Bigelow, Dr. Garg, Dr.
Roberts, Glenn's ARO
Director Dr. Perez-Davis,
Rossoll, Rybalko and
Herges.

led by NASA's Glenn Research Center. Members of Glenn's Structures and Materials Division, including Glen Bigelow, Anita Garg (UT), Darrell Gaydosh (OAI), Ronald Noebe (team lead), and Santo Padula, teamed with NASA's Langley Travis Turner.

Honorable Mention David Arend, Aeropropulsion Division

## **High Potentials**

**Group Award** 

The Large Scale Low-Boom Supersonic Inlet Student Team, a model design team from the University of Illinois at Urbana-Champaign. The team of Tyler Gillen, Tommy Herges and Michael Rybalko supported testing in Glenn's 8-by 6-Foot Supersonic Wind Tunnel.

## **Honorable Mention**

*Damon Rousis*, a graduate intern at the Georgia Institute of Technology, supporting Glenn.

To view the complete list of the 2010 ARMD AA award winners and honorable mentions, visit http://www.aeronautics.nasa.gov/aa\_awards.html.



—Edited by S. Jenise Veris

# FIRST Buckeye Regional Scores a "10"

## **Celebrating 10 Years of Unique Learning Experiences**

This year marked a milestone in NASA Glenn's quest for more students to experience the fun, accessibility and importance of science and engineering. In April, over 1,400 high school students competed for honors and recognition at the 10th annual FIRST Buckeye Regional Robotics Competition held at Cleveland State University's Wolstein Center.

FIRST (For the Inspiration and Recognition of Science and Technology) "turns on" young people to exciting science, technology, engineering and math (STEM) careers with the bravado of sport. Students of varying skill levels can earn medals, trophies and scholarships teaming with professional mentors, volunteers and sponsors from their community while designing, building and competing robots of



Cleveland East Tech, an annual participant and NASA's first-sponsored school.

their own creation. For the past 10 years, the Buckeye Regional has proven over and over again to be an effective venue to expose local students to STEM activities.

#### **Pathfinders**

John Hairston, Glenn's External Programs director, and Marty Kress, former Glenn center deputy director and then vice president at Battelle, joined forces 10 years ago to recruit volunteers and sponsors to establish a regional competition and expand participation in FIRST throughout Northeast Ohio.

Ann Heyward, current Buckeye Regional Planning Committee chairperson and OAI vice president of Research &



Clockwise, above: Buckeye Regional referees; 2011 playing field; announcer and scorekeepers.

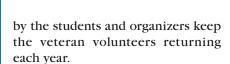
Educational Programs, cameon-board as treasurer

the first year of the Buckeye Regional. "I didn't know anything about FIRST," she admits, "but after seeing 3,000 teenagers screaming with excitement about science and technology, and learning of FIRST's impact on Cleveland's East Tech High School students, I was hooked. They were the first inner city school to win FIRST's prestigious Chairman's award, due to their perseverance and Glenn's great engineering mentors."

Sally Harrington, Community and Media Relations Office, long-time Buckeye Regional media representative and a 2011 Buckeye Regional Outstanding Volunteer of the Year, said it was initially challenging to get media interested in the event, but that changed quickly. "Over the years, I enjoy visiting the 'pits' and discovering what various teams have to offer. It then becomes easy to direct reporters and videographers over to talk to the students, who are always eager to tell their stories."

#### **Valued Volunteers**

Buckeye's field power control/scorekeepers, Chip Redding, Mechanical & Fluids Systems Division, and his brother Adam, from the Testing Division along with lead referee, Rich Manco (SLI), are among the many volunteers who enthusiastically return every year to work with the students and support the FIRST program goals. They agree that appreciation shown



Initially recruited as a regional sponsor, Peter Buca, vice president of Technology & Innovation, Parker

Hannifin Corp, was so inspired by the event that he made it a family affair. He and his wife, Diane, mentored the James Ford Rhodes High School team, their alma mater, for two seasons. Now, he serves as a referee and Diane is on the Planning Committee. Their daughter, Melody, participates in FIRST's Lego League and also volunteers. "We have remained motivated because of the kids and changes witnessed through the FIRST experience," he said. "It restores the faith of our children in what they are capable of doing, not what will be done for them."

After 10 years of competitions, the end result is still the same. The event isn't centered on tallying up scores to see which teams go forward to the national competition; rather, it's about celebrating the fact that everyone involved in FIRST is a winner.

By S. Jenise Veris

# SAMS, MAMS

Continued from page 1

- Unit retrofitted for operation on Russia's Mir space station; operated or 3½ years (longest running U.S. hardware in NASA-Mir Science Program)
- Unit from Mir transferred to National Air and Space Museum in Washington,
- Regarded highly for dependable, quality operation



# **Prairie Burning Preserves Rare Landscape at Plum Brook**

## **Carrying on Native American Tradition**

For thousands of years, Native Americans burned prairies in the land that now resides within the gates of NASA's Plum Brook Station. Fire was used to herd deer for hunting and to keep forests and landscapes open for easy travel, food gathering and hunting activities. Today, environmental scientists at Plum Brook continue the tradition to conserve rare landscapes and plant species.

"While fire is often associated with destruction and devastation, it is the exact opposite on a prairie," explained Prairie Biologist/Ohio Prescribed Prairie Fire Manager John Blakeman, SLI/Plum Brook. "Prairies thrive on fires, which get rid of weeds and brush and enable new seeds to germinate. It's also a more economical way to maintain the land than mowing."

On April 21, Environmental Scientist Rosemary Giesser, SAIC/Safety, Health and Environmental Division, and Blakeman oversaw the burning of 200 acres of prairie at PBS. Two weeks later, the team scattered prairie grass seeds collected at Plum Brook to jump start the restoration process. Consequently, fields—that appeared black and barren—have begun sprouting green grasses and forbs.

Giesser explained that Plum Brook's Species Management Plan helps set priorities for responsible stewardship, and falls under the objective: "exercise responsible stewardship of natural resources at Plum Brook" in Glenn's Environmental Management System. These natural resources include wild forests, oak savannas, ancient prairies, open meadows and flowing streams—and within these areas live wildlife and rare plants.

Without proactive management and conservation, such as prairie burning, dogwood brush could take over meadows and prairies; invasive weeds could degrade meadows and ditches; rare plants and species could disappear; and deer could overpopulate PBS, overgraze and begin to die of starvation.

For Blakeman, strategic use of prescribed fire is more than a practical, economical solution to controlling unwanted invasive plants and conserving the historic Firelands landscape at Plum Brook.

"When I begin the process of prairie burning, I give a mental nod to the Native Americans," he said. "This is the last living remnant of the people who inhabited this land before us. The Delaware and other Native American cultures burned these landscapes for centuries, and those fires created and maintained Plum Brook prairies. We are now restoring them."

Blakeman also noted "Within a decade, we hope to have up to 3000 acres of restored tallgrass prairie at Plum Brook, which could then be harvested in winter as cellulosic biofuels feedstock for renewable energy production. Winter harvest and fire maintains the prairie, so the energy of today's prairie fires may someday be captured and be made renewable, while maintaining the natural tallgrass prairies."

By Doreen B. Zudell

# **SMEP Systems Engineering Graduates**

Continued from page 1

"It's proven that when good systems engineering is practiced, the result is a more efficient and effective workforce that can take on challenging tasks," Forkosh said. "A strong engineering workforce puts us in a position to successfully advocate for new work."

For more information about the SMEP, contact Jennifer Budd, 216–433–8021. She is responsible for the overall development and management of SMEP.

#### Level I Proficiency

Scott Bleisath, Martin Bradish, Jeffrey Briggs, David Carek, Leon Collins, Joshua Freeh, Bertsel Golden, David Grantier, Thomas Gyekenyesi, Alan Hewston, Keith Hunker, Jeffrey Juergens, Obadiah Kegege, Robert Klimek, Eric Knoblock, Alan Linne, Steven Mainger, Janice Romanin, George Saad, Andrew Suttles, Ted Tin and Xiao-Yen Wang

#### Level II Proficiency

Lynn Capadona, Ulrich Wiedenmannott, Edith Parrott and Richard Deloof

#### Level III Proficiency

Todd Tofil, Karen Weiland and Natalie Goldin

By Doreen B. Zudell



## **Propelling Glenn Forward: Our Center Directors**

# Dr. Whitlow's Skill and Style Advanced Glenn

This is the tenth and final article in a series spotlighting NASA Glenn's center directors.

When Dr. Woodrow Whitlow Jr., NASA Glenn's Center Director from December 2005 through March 2010, arrived at the center in 1998, he had already established himself as a distinguished researcher and manager. He also brought with him a strong work ethic, genuine respect for his staff and passion for NASA's mission.

Whitlow began his professional career at NASA Langley in 1979, after earning degrees in Aeronautics and Astronautics from the Massachusetts Institute of Technology (MIT). His unique combination of skill and style propelled him to high-ranking roles at NASA's Headquarters, Langley, Glenn (Research and Technology Director), and Kennedy, before returning to serve at the helm at Glenn.

While at Glenn, Whitlow earned a reputation and recognition as a strong leader and mentor of a diverse workforce empowered to develop to their full potential. Under his leadership, the center expanded its technical role within the agency and earned a reputation for delivering on its commitments—quality, innovative products—on or ahead of schedule.

In 2010, Administrator Charles Bolden called on Whitlow to serve as Associate Administrator of the newly formed Mission Support Directorate at Headquarters.

AeroSpace Frontiers recently caught up with Whitlow and asked him a few questions about his time at NASA Glenn, and what's keeping him busy these days.

## What brought you to NASA?

As a young boy, I was inspired watching Alan Shepard, John Glenn, and the other Mercury Program astronauts rocket into space. I decided then that I would go to college, get a job at NASA and hopefully become an astronaut. When I was in graduate school at MIT, Langley funded my graduate research to study

novel methods of modeling unsteady, transonic flows. I was selected for a position at Langley after I graduated.

# What is your fondest memory of your time as Center Director?

I enjoyed working with the senior leadership team and workforce to secure exciting roles for Glenn in various agency programs. It was most satisfying to have the center selected for major assignments and hear the rest of NASA and the aerospace community comment on how well we were performing. Interacting with and learning from a brilliant staff, as well as leading improvements to the center's physical condition are memorable highlights. I like to think that I left Glenn in better shape than when I became Director.

# What advice would you give young people entering the NASA workforce?

There is no better place to have a career. They can do exciting things that won't be done anywhere else. And, if they commit to excellence and being the very best in their fields and are willing to work hard, a NASA career can take them to places they never dreamed. Finally, I would tell them to never stop having fun in their careers.



C-2007-1198

Photo by Quentin Schwinn

Dr. Whitlow in his Glenn office in 2007.

## What keeps you busy these days?

Time goes by really fast. I recently celebrated my one-year anniversary as associate administrator and I'm busy rounding out my leadership team. One of my key goals is to enable program and institutional capabilities that are necessary to conduct NASA's aeronautics and space activities. To accomplish this, I have to make certain that the agency's technical infrastructure and workforce are appropriate to meet current and emerging requirements.

My family and I still live in Cleveland, and the weekly trips to the airport or traveling the highways take up a little time too.

-By Doreen B. Zudell



# News and Events

## NASA Advisory Council Visits>

Members of the NASA Advisory Council (NAC) visited NASA Glenn and the Ohio Aerospace Institute, May 4 to 6. The NAC provides the NASA Administrator with counsel and advice on programs and issues of importance to the agency. Glenn staff conducted tours and briefed council members on several areas of research. Pictured is Stephanie Vivod sharing updates on aerogel materials research developed at Glenn.





C-2011-845

Glenn's Earth Day Committee held its annual garlic mustard pull at Lewis Field on April 29. Teresa Monaco, Procurement Division, led the activity (near Abrams Creek) aimed at minimizing the effects of the invasive garlic mustard plant. The plant threatens the health, or even existence, of native plants and animals by monopolizing light, moisture, nutrients, soil and space. Pictured, left, is Monaco teaching Lewis Little Folks student Natalie Myers how to identify and pull the plant. Insert photo shows a close-up view of a garlic mustard plant.

Photo by Marvin Smith



Photo by Christie Myers

## Final Flight Highlights>

On April 25, STS-133 pilot Eric Boe and mission specialist Steve Bowen visited Glenn. They shared highlights with employees about the 13-day mission to the International Space Station and anecdotes about being crewmembers of Discovery's final flight. Eight Glenn experiments and hardware traveled to station on Discovery's historic mission.



C-2011-971

Photo by Michelle Murphy

# NASA Stamps





On May 4, the U.S. Postal Service (USPS) unveiled two new stamps at NASA's Kennedy Space Center commemorating the 50th anniversary of the first U.S. manned spaceflight. Above, left, is the stamp that honors NASA's Project Mercury and Alan Shepard's historic flight on May 5, 1961, aboard the spacecraft Freedom 7. On the right is the stamp commemorating NASA's unmanned MESSENGER mission, which reached Mercury on March 17, 2011, to become the first spacecraft to orbit the planet. The two missions frame a remarkable era of America advancements in space exploration through more than 1,500 manned and unmanned flights.



C-2011-1035

## Postmaster Gives Keynote Address

Center Deputy Director Jim Free joined Glenn's Asian/Pacific Islanders Advisory Group in welcoming Cleveland's Postmaster W. Spencer Hsu (pictured, left) as keynote speaker for the 2011 Asian/Pacific Islander Heritage

celebration on May 13. Hsu gave a light-hearted talk on challenges he overcame as

a first-generation immigrant and lessons learned leading to a career with the U.S. Postal Service. The celebration also included a food sampling and cultural entertainment, including Ohana Aloha from Strongsville (pictured).



C-2011-1055
Photos by Michelle Murphy



Betsy DeLaCruz has been selected project support assistant for the Aeronautics Research Office. DeLaCruz previously served as an executive support assistant with the Space Flight Systems Directorate.



Maureen Messich has been selected NASA Glenn's executive information specialist, Office of the Director. Messich serves as the center's authority on interpreting and applying agency and federal correspondence policies, procedures and instructions for executive communications. Messich has more than 30 years of NASA administrative experience, including serving most recently as executive support assistant to the director of the Facilities and Test Directorate.

Messich

John E. Thomas has been selected chief of the Electrical and Electromagnetics Branch, Avionics and Electrical Systems Division. Thomas brings 25 years of experience developing and delivering space flight hardware and experiments, and leading activities from preliminary design to payload integration, including a recent position as Developmental Flight Instrumentation consultant to NASA Marshall.



LEWIS LITTLE FOLKS (LLF) GOLF OUTING: LLF's 11th annual Benefit Golf Outing is Friday, June 17 at the Bob-O-Link in Avon, Ohio. All are welcome. Contact: 216-433-5264.

GEORGE M. LOW (GML) AWARD: The GML Award is NASA's premier quality performance award for NASA's prime and subcontractors. All contractor nomination packages need to be submitted to their Directorate Office by June 17.

FOLLOW NASA GLENN ONLINE







## **Article Deadlines**

News items and briefannouncements for publication in the July issue is noon, June 17. Larger articles require at least one month notice.

READ US ON THE INTERNET: http://aerospacefrontiers.grc.nasa.gov

Hermes Award 2010-2011





LUNCH WITH THE DIRECTOR: The next "Lunch with the Director" is Wednesday, June 22 at the upper level of the Cafeteria. Space Flight Systems Director Bryan Smith is the featured director. No RSVP is necessary—just bring your lunch, pull up a chair and join the discussion.

IFPTE LOCAL 28, LESA MEETING: LESA will hold its next membership meeting on Wednesday, July 13 at noon in the Small Dining Room of the Employee Center.

SUMMER FIESTA: Back by popular demand—Glenn's Hispanic Advisory Group will host a Summer Fiesta on Aug. 5 from 4 to 9 p.m. at the Picnic Grounds. There will be games for children and adults, door prizes, music and great food. Tickets sales begin in June. See Today@Glenn for details.

## Correction

Christopher Gallo, a member of the *Development of Halbach Magnetic Bearings for Aerospace Applications* team, was incorrectly identified by name and organization in the May issue, p 5. Gallo is a member of the Systems Engineering and Analysis Division.



Lester C. Corrington, 93, who retired in 1972 with 40 years of NACA/NASA



Corrington

service, died April 25. Corrington began his federal career in 1932 at Langley Research Laboratory before transferring in 1942 to NACA's new Aircraft Engine Research Laboratory (now, NASA Glenn). He was assigned

to oversee full-scale testing of Allison engines to aid U.S. aircraft production during WWII. As Head of Engine Operations, he helped design and install several test apparatus in the Engine Research Building, including eight single-cylinder engine test stands used for fuels testing and lubricant research. Corrington transitioned to Space Vehicle Systems during the 1960s. He later retired as assistant chief for Technical Operations, Space Nuclear Systems Office.

Paulina "Polly" Wagar, 85, who retired in 1986 with 17 years of NASA service, died Feb. 11. Wagar was an occupational health nurse supporting Medical Services under the Health, Safety and Security Division. She trained as a WWII Cadet nurse and worked at the Veterans Administration Hospital in Brecksville, before joining the NASA workforce.



I want to thank the NASA Community for your heartfelt words and prayers throughout my husband's illness and passing. It is such a wonderful feeling to know that my fellow workers at NASA are here for comfort in my time of sorrow.

—Susan Print

Check out the NASA Glenn Exchange On-Line Gift Shop at www.nasagiftshop.com

#### **National Aeronautics and Space Administration**

John H. Glenn Research Center at Lewis Field

21000 Brookpark Road Cleveland, Ohio 44135

#### www.nasa.gov

AeroSpace Frontiers is an official publication of Glenn Research Center, National Aeronautics and Space Administration. It is published the second Friday of each month by the Community and Media Relations Office in the interest of the Glenn workforce, retirees, government officials, business leaders and the general public. View us online at <a href="http://aerospacefrontiers.grc.nasa.gov">http://aerospacefrontiers.grc.nasa.gov</a>. Submit contributions via e-mail to the editor: doreen.b.zudell@nasa.gov or 216–433–5317.

Editor: **Doreen B. Zudell**, SGT, Inc. Assistant Editor: **S. Jenise Veris**, SGT, Inc. Managing Editor: **Kelly R. DiFrancesco** 





VOLUME 13 ISSUE 6 JUNE 2011

# Glenn Payload and Pre-Launch Contributions to STS-134 Mission

When space shuttle Endeavour reached liftoff on Monday, May 16, it carried six experiments developed over the last ten years at NASA's Glenn Research Center to the International Space Station. They included:

- The suitcase-sized Materials International Space Station Experiment 8 (MISSE-8) developed by the U.S. Naval Research Laboratory (NRL), which carried three Glenn experiments. MISSE-8 includes electronics developed in Glenn's Mobile And Remote Sensing (MARS) Lab to support, the Forward Technology Solar Cell Experiment (FTSCE) III, a partnership effort with the NRL. The other two experiments housed on MISSE-8 include the Polymers Experiment and the Ferroelectric Reflectarray Critical Components Experiment (F-Recce).
- Investigating the Structure of Paramagnetic Aggregates from Colloidal Emulsions (InSPACE-3)
- Shear History Extensional Rheology Experiment (SHERE II)
- Light Microscopy Module-Biological Technical Demonstration (LMM-BIO-2)

Detailed information on each of these Glenn experiments/hardware is available at http://www.nasa.gov/centers/glenn/news/pressrel/2011/11-022-mission.html.

Although a repair to Endeavour's heater circuit system led to the postponement of the original April 29 launch date, NASA-sponsored pre-launch events offered

entertaining and engaging events to military families and friends invited to this special occasion. NASA's Glenn Educational Programs Office coordinated hands-on activities to promote science, technology, engineering and mathematics (STEM) education at the STS-134 Education Pre-Launch Summit and the NASA Education Station at the Kennedy Athletic, Recreation & Social (KARS) Park.



Above:At KARS Park, budding scientists explore a mini vacuum chamber, and left, students simulate the Hubble Telescope. At the event for military families: below, left, staff help children create an edible moon buggy and, below, accessorize with NASA tattoos.





Article and photos